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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,690	11/12/2003	Jeffrey A. Andrews	MS1-1839US	7002

22801 7590 06/28/2005

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EXAMINER
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CHEN, PO WEI

ART UNIT	PAPER NUMBER
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2676

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/706,690

Applicant(s)

ANDREWS, JEFFREY A.

Examiner

Po-Wei (Dennis) Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/12/03</u> | 6) <input type="checkbox"/> Other: ____  |

### DETAILED ACTION

Claims 1-52 are pending in this application. Claims 1, 9, 11, 28, 32, 41 and 49 are independent claims.

The present title of the invention is "Methods and systems for transparent depth sorting". This action is non-final.

#### *Double Patenting*

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims 1-2, 6-14, 18, 22-23, 27-34, 38-44 and 48-52 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-34 of copending Application No. 10/661,343. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 3-5, 15-17, 19-21, 24-26, 35-37, 45-47 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-34 of copending Application No. 10/661,343. Although the conflicting claims are not identical, they are not patentably distinct from each other because w buffers, 1/w buffers or 1/z buffers functions essentially the same as z buffers. It would have been obvious matter of design choice to use w buffers, 1/w buffers or 1/z buffers instead of z buffers.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### *Claim Rejections - 35 USC § 102*

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 7-14, 18 and 27-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Duluk, Jr. et al. (US 6,476,807; refer to as Duluk herein).

6. Regarding claims 1-2 and 7-8, Duluk discloses a method for hidden surface removal comprising:

A method comprising: sorting, using multiple depth buffers, depth data associated with multiple transparent pixels that overlies one another to identify an individual pixel that lies closest to an associated opaque pixel; computing a transparency effect of the identified pixel relative to the associated opaque pixel; and after said computing, identifying a next closest transparent pixel relative to the opaque pixel and computing, for the next closest pixel, a transparency effect

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relative to the transparency effect that was just computed; wherein said multiple depth buffers comprise z buffers; repeating said act of identifying for any additional overlaying transparent pixels (lines 7-25 of column 16, line 55 of column 32 to line 41 of column 33 and line 42 of column 48 to line 35 of column 49; the front most opaque sample is identified and two buffers, Zfar and Znear are used to identify and rendered each transparent primitives in spatial order starting with the layer closest to the front most opaque layer. Also, while claim recites source buffer is only readable and destination buffer is both readable and writable, it is clear if the transparent sample is closer to the opaque layer, its value will replace, or write, the current value of Znear buffer. And Zfar buffer will not change value, thus, can be considered as only readable).

7. Regarding claims 9-10, statements presented above, with respect to claim 1 above are incorporated herein. Further more, while claim recites hardware comparison logic, the term is broad enough to include the z values comparing logic between two buffers, Zfar and Znear.

8. Regarding claims 11-14, 18 and 27, statements presented above, with respect to claims 1-2 and 7 above are incorporated herein. Further more, z buffers correspond to depth buffers. While claim recite the pixels lies along a ray, it is clear that the samples being rendered have same location with different depth values, which are same as lies along a ray (Fig. 25-27 of Duluk). And Duluk discloses both buffers Znear and Zfar switch roles (lines 13-14 of column 33).

9. Regarding claims 28-31, statements presented above, with respect to claims 1-2 and 7 above are incorporated herein. Further more, Duluk discloses a graphics subsystem (Fig. 10). And Duluk discloses both buffers Znear and Zfar switch roles (lines 13-14 of column 33).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3-6, 15-17, 19-26 and 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duluk, Jr. et al. (US 6,476,807; refer to as Duluk herein).

12. Regarding claims 3-5, Duluk does not disclose w buffers, 1/w buffers or 1/z buffers were used instead of z buffers. However, it would have been obvious matter of design choice to modify Duluk by having the buffers as w buffers, 1/w buffers or 1/z buffers, since applicant has not disclosed that having the buffers solves any stated problem or is for any particular purpose and it appears that the z buffers would perform equally well.

13. Regarding claim 6, Duluk discloses a method for hidden surface removal comprising:  
wherein said act of sorting comprises: identifying one of the multiple buffers as a destination buffer that is both readable and writable; identifying another of the multiple buffers as a source buffer that is only readable; and flipping which of the multiple buffers is considered as the destination buffer and the source buffer during said acts of sorting, computing and identifying (lines 7-25 of column 16, line 55 of column 32 to line 41 of column 33 and line 42 of column 48 to line 35 of column 49; Zfar and Znear buffers' roles are switch during sorting). It is noted that Duluk does not specify source buffer (Zfar) is only readable. However, it is clear that Duluk discloses that when the transparent sample z value is larger than Znear but smaller than Zfar, then the sample is closer to the opaque layer. Thus, the sample z value will replace the

current Znear value, or writable, where Zfar does not change its value, or read-only (line 42 of column 48 to line 35 of column 49). It would have been obvious matter of design choice to modify Duluk by having one of buffers is read-only, since applicant has not disclose that having one of buffers as read-only solves any stated problem and it appears that the buffers would perform equally well by not changing (write) the value to the buffer.

14. Regarding claims 32 and 38, statements presented above, with respect to claims 1-2 and 7 above are incorporated herein. It is noted that Duluk does not disclose a writeback counter to count writebacks that occur to at least one of the two physical depth buffers and transparent depth sorting is configured to terminate when the writeback counter indicates that no writebacks have occurred. However, Duluk discloses a Z cull unit which counts the number of transparent samples would be processed for the buffers functions the same (line 55 of column 32 to line 41 of column 33). It would have been obvious matter of design choice to modify Duluk by having a writeback counter to count writebacks that occur to at least one of the two physical depth buffers since applicant has not discloses that having the writeback counter solves any stated problem and it appears that the buffers would perform equally well with the Z cull unit which determines when all the sorting and rendering of samples for the fragment have been all processed.

15. Regarding claims 15-17 and 19-21, statements presented above, with respect to claims 1-5 above are incorporated herein.

16. Regarding claims 22-26, statements presented above, with respect to claims 3-6 above are incorporated herein.

17. Regarding claims 33-37 and 39-40, statements presented above, with respect to claims 1-5 and 32 above are incorporated herein. Also see Fig. 10 of Duluk.

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*Conclusion*

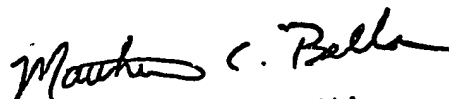
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (571) 272-7783. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Po-Wei (Dennis) Chen  
Examiner  
Art Unit 2676

Po-Wei (Dennis) Chen  
June 27, 2005

  
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